KTUPredict practice paper, Set 1: built from the most repeated past questions. Not an official KTU paper.

PCEOT501 Microcontrollers and Embedded Systems

Practice paper · maximum marks 60

PART A Answer all questions. Each carries 3 marks. (24 marks)

1.	What is an Embedded operating system? Briefly explain the types of embedded operating system.	**3**
2.	Discuss the waterfall model of embedded product development lifecycle.	**3**
3.	LEDs are connected to ports P1 and P2. Write an 8051 C programming code that shows the count from 0 to FFH (0000 0000 to 1111 1111 in binary) on the LEDs.	**3**
4.	Describe the different types of addressing modes in 8051.	**3**
5.	Explain the Interrupt Priority (IP) register of the 8051 and how the 8051 responds when two or more interrupts are requested at the same time, including the default priority order.	**3**
6.	Explain the term SPI protocol.	**3**
7.	List any four registers in the ARM programmer's model and explain the role of each.	**3**
8.	What is meant by conditional execution in ARM? Explain the significance of condition flags with one suitable example.	**3**

PART B Answer any one full question from each module. Each question carries 9 marks.

Module 1

9a.	With the help of a board level schematic explain the different elements of Arduino UNO board.	**5**
9b.	Describe the hardware-software co-design steps in the Embedded System development process.	**4**

OR

10a.	Explain the memory organization in 8051 microcontroller.	**5**
10b.	Explain the on-chip peripherals of the 8051 microcontroller other than memory, stating one typical use of each.	**4**

Module 2

11a.	Write an 8051 ALP/Embedded C program to copy a block of 12 bytes of data from internal RAM locations starting at 30H to locations starting at 50H.	**4**
11b.	Write an ALP to turn on and turn off an LED by interfacing with 8051 microcontroller	**5**

OR

12a.	Consider the instruction MOV DPTR, A. Is this a valid one? Comment with reason.	**5**
12b.	Write an assembly language program to perform the following arithmetic operations a) addition b) subtraction	**4**

Module 3

13a.	Write an embedded C program to monitor the temperature of a system using LM35 and seven segment display with the aid of Arduino Uno board.	**5**
13b.	Explain about the interfacing of LCD peripheral with 8051 Microcontroller. Write an ALP to display the message 'HELLO' in LCD Display.	**4**

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OR

14a. Explain the interfacing of a stepper motor with the 8051 microcontroller. **5**

14b. With the help of a suitable example explain how LCD interfacing is done in 8051 microcontroller. **4**

Module 4

15a. Write an ARM assembly language program to find the greatest common divisor (GCD) of two non-zero unsigned 32-bit numbers in R1 and R2 by repeated subtraction, and place the result in R0. **5**

15b. Explain any four differences between RISC and CISC architectures, and state why the ARM processor is classified as a RISC processor. **4**

OR

16. Explain the operating modes of the ARM processor, classifying them as privileged and unprivileged modes. **9**

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